

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 June 2004 (17.06.2004)

PCT

(10) International Publication Number
WO 2004/050744 A1

(51) International Patent Classification⁷: **C08G 77/08**

MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU,
SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA,
UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(21) International Application Number:
PCT/AU2003/001600

(22) International Filing Date: 1 December 2003 (01.12.2003)

(25) Filing Language: English

(26) Publication Language: English

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(30) Priority Data:
10/308,562 2 December 2002 (02.12.2002) US

Declarations under Rule 4.17:

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— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

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— *of inventorship (Rule 4.17(iv)) for US only*

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Published:

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,

— *with international search report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS FOR PRODUCING POLYSILOXANES AND USE OF THE SAME

(57) Abstract: A process for the preparation of an organosilicon condensate which comprises reacting together (A) at least one silicon containing compound having at least one silanol group; and (B) at least one silicon containing compound having at least one -OR group in the presence of (C) a calcium or magnesium catalyst selected to allow the reaction to proceed and (D) at least one solvent. Advantageous catalysts include calcium hydroxide, calcium oxide, magnesium hydroxide or magnesium oxide. Advantageously the solvent may be a protic solvent such as water, methanol, ethanol, 1-propanol, 2-propanol, 1-butanol and 2-butanol. The invention also relates to condensates, such as siloxanes, prepared by the process.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU03/01600

A. CLASSIFICATION OF SUBJECT MATTER				
Int. Cl. ⁷ : C08G 77/08				
According to International Patent Classification (IPC) or to both national classification and IPC				
B. FIELDS SEARCHED				
Minimum documentation searched (classification system followed by classification symbols)				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) DWPI & Keywords: siloxane, silanol, alkoxy, calcium, magnesium, catalyst, and similar terms. JAPIO & Keywords as above.				
C. DOCUMENTS CONSIDERED TO BE RELEVANT				
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.		
X	JP 03197486 A (SHIN ETSU CHEM CO LTD) 28 August 1991 Abstract	1-10, 18-24, 32-37		
A	EP 382366 A (DOW CORNING LTD) 16 August 1990 Pages 2-3, Examples 1&3	1-56		
A	EP 503825 A (DOW CORNING S.A.) 16 September 1992 Entire document	1-56		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex				
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Date of the actual completion of the international search 24 December 2003		Date of mailing of the international search report 7 JAN 2004		
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/01600

C (Continuation).

DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2309460 A (GENERAL ELECTRIC COMPANY) 30 July 1997 Entire document	1-56
A	WO 0104186 A (FRAUNHOFER-GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG E.V.) 18 January 2001 Entire document	1-56
A	GB 918823 A (DOW CORNING CORPORATION) 20 February 1963 Entire document	1-56
A	US 5109093 A (Rees et al.) 28 April 1992 Entire document	1-56
A	US 3668228 A (Zbinden et al.) 6 June 1972 Entire document	1-56
A	JP 03-017158 A (TOSHIBA SILICONE CO LTD) 25 January 1991 Abstract	1-56

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU03/01600

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
JP	03197486				
EP	0382366	AU	49168/90	CA	2009278
		US	5109094	JP	2235931
EP	0503825	CA	2062333	JP	5178996
GB	2309460	DE	19701266	US	5210129
		US	5948853	FR	2744128
WO	0104186	CA	2378756	JP	9310022
GB	918823	DE	19932629	US	5210129
US	5109093	EP	1196478		
		AU	49169/90	CA	2009276
		JP	2235933	EP	0382365
US	3668228	BE	734472	CH	492071
		DE	1928610	CH	526675
		GB	1241893	FR	2010813
				NL	6908983
JP	03017158			SU	482048
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